

Remarks

In view of the above amendments and the following remarks, reconsideration of the outstanding office action is respectfully requested.

The rejection of Claims 4 and 6-9 under 35 U.S.C. 103(a) for obviousness over U.S. Patent No. 5,742,734 to DeJaco ("DeJaco") in view of U.S. Patent No. 6,029,126 to Malvar ("Malvar") is respectfully traversed.

On page 5 of the September 4, 2007 office action, the Examiner asserts that DeJaco discloses a method for preprocessing audio data to be processed by a codec having a variable coding rate. Applicants disagree.

In column 2, lines 34-42, DeJaco discloses that an optimum bit rate for coding is determined depending on the characteristics of the input signal, as also acknowledged by the Examiner on page 2 of the Advisory Action. In DeJaco, the determined bit rate is used to code the input signal by the vocoder. That is, DeJaco discloses simply obtaining bit rates from the input signals without making any changes to the input signals.

In contrast, the present invention relates to a method of preprocessing the audio data before the audio data is processed by the codec. That is, the audio data, i.e., input data to the codec, is altered (e.g., the amplitude of the audio data is adjusted) before it is processed by the codec. In the method of the present invention, the codec has a variable coding rate as recited in Claims 4 and 6-9 of the present application. This means that the codec determines a coding rate of the audio data inputted thereto. The method of the present invention involves preprocessing (e.g., adjusting) the audio data before inputting it to the codec such

that a higher coding rate for the audio data is determined by the codec. Thereafter, based on the preprocessed audio data (e.g., adjusted amplitude), a coding rate for the audio data is determined by the codec.

As noted above, however, in DeJaco the input signal is not preprocessed before being processed in the vocoder. As indicated in column 3, line 56 to column 4, line 15 of DeJaco, rate decision elements select suggested encoding rates by using subband energy values, which are determined in subband energy computation elements, and encoding rate selection element selects the higher of the suggested coding rates and provides the higher encoding rate as the selected encoding rate. In other words, DeJaco determines the encoding rate to be used in the vocoder by merely selecting the higher encoding bit rate than the suggested encoding bit rates, rather than by preprocessing the audio data such that the higher encoding bit rate is determined by the codec. Accordingly, the configuration of determining an encoding rate as in DeJaco may be used within the codec of the present invention, but is not relevant to the step of preprocessing data before the data is subject to the codec of the present invention.

In addition, the Examiner asserts that Malvar discloses adjusting the amplitude of audio data. Malvar, however, does not disclose adjusting the amplitude of audio data of the decided interval, which is to be encoded in a low bit rate in the codec, before the audio data is processed by the codec, as claimed. Nowhere in Malvar is there any disclosure or suggestion regarding the use of automatic gain control to adjust the amplitude of audio data of the decided interval, which is to be encoded in a low bit rate in the codec, before the audio data is processed by the codec, as claimed. In column 2 lines 41-56, Malvar merely describes automatic gain control as an example of enhancement operators incurring a processing delay that will be added to the codec delay, without mentioning its detailed

functions. Malvar discloses, in column 2, lines 22-26, that it is desirable to have the codec handle speech degraded by reverberation, office noise, electrical noise, background music, etc, as also noted by the Examiner on page 2 of the Advisory Action. Thus, the enhancement operators are required in the codec, not for adjusting the amplitude of the audio data such that the audio data is coded in a higher rate by the codec but for processing degraded speed in the codec.

There is no basis for combining the teachings of DeJaco and Malvar. In Malvar, the automatic gain control is merely used to handle the degraded speech in the codec. This is far different from determining the speech encoding rate in the vocoder. Accordingly, Malvar is not properly combinable with DeJaco. In other words, using the automatic gain control to handle the degraded speech in the codec and determining the speech encoding rate in the vocoder are so different from one another that one of ordinary skill in the art would have no reason to combine teachings from one of these areas and apply them to the other.

The rejection of Claims 2 and 3 under 35 U.S.C. § 103(a) for obviousness over DeJaco in view of Malvar and further in view of U.S. Patent No. 4,539,526 to Davis ("Davis") is respectfully traversed.

In column 2, lines 34-42, DeJaco discloses that an optimum bit rate for coding is determined depending on the characteristics of the input signal, as also acknowledged by the Examiner on page 2 of the Advisory Action. In DeJaco, the determined bit rate is used to code the input signal by the vocoder. That is, DeJaco discloses simply obtaining bit rates from the input signals without making any changes to the input signals.

In contrast, the present invention relates to a method of preprocessing the audio data before the audio data is processed by the codec. That is, the audio data, i.e., input data to the codec, is altered (e.g., the amplitude of the audio data is adjusted) before it is processed by the codec. In the method of the present invention, the codec has a variable coding rate as recited in Claims 2 and 3 of the present application. This means that the codec determines a coding rate of the audio data inputted thereto. The method of the present invention involves preprocessing (e.g., adjusting) the audio data before inputting it to the codec such that a higher coding rate for the audio data is determined by the codec. Thereafter, based on the preprocessed audio data (e.g., adjusted amplitude), a coding rate for the audio data is determined by the codec.

As noted above, however, in DeJaco the input signal is not preprocessed before being processed in the vocoder. As indicated in column 3, line 56 to column 4, line 15 of DeJaco, rate decision elements select suggested encoding rates by using subband energy values, which are determined in subband energy computation elements, and encoding rate selection element selects the higher of the suggested coding rates and provides the higher encoding rate as the selected encoding rate. In other words, DeJaco determines the encoding rate to be used in the vocoder by merely selecting the higher encoding bit rate than the suggested encoding bit rates, rather than by preprocessing the audio data such that the higher encoding bit rate is determined by the codec. Accordingly, the configuration of determining an encoding rate as in DeJaco may be used within the codec of the present invention, but is not relevant to the step of preprocessing data before the data is subject to the codec of the present invention.

On page 9 of the September 4, 2007 office action, the Examiner asserts that DeJaco discloses classifying the audio data based on a characteristic of the audio data. DeJaco,

however, does not disclose classifying the audio data into cases where the audio data includes monophonic sound and polyphonic sound. Rather, DeJaco filters an input signal into a low frequency component and a high frequency component and determines whether the speech including the unvoiced sounds or music is present in the input signal. In contrast, the classification of the audio data of the present invention is to determine whether the audio data includes monophonic sound or polyphonic sound.

In addition, the Examiner asserts that Malvar discloses performing automatic gain control (AGC) preprocessing. Malvar, however, does not disclose performing AGC preprocessing of frames of audio data classified as based on a characteristic of audio data before the audio data is processed by a predetermined codec. Nowhere in Malvar is there any disclosure or suggestion regarding performing AGC processing of all frames of audio data in case the audio data includes monophonic sound or performing AGC processing of selected frames in case the audio data includes polyphonic sound, as claimed. In column 2 lines 41-56, Malvar merely mentions automatic gain control as an example of enhancement operators incurring a processing delay that will be added to the codec delay, without mentioning its detailed functions. Malvar discloses, in column 2, lines 22-26, that it is desirable to have the codec handle speech degraded by reverberation, office noise, electrical noise, background music, etc, as also noted by the Examiner on page 2 of the Advisory Action. Thus, the enhancement operators are required in the codec, not for adjusting the amplitude of the audio data such that the audio data is coded in a higher rate by the codec but for processing degraded speed in the codec.

The Examiner further asserts that Davis discloses a system that performs preemphasis on a signal prior to encoding or decoding, where preemphasis is based on a ratio of high frequency energy to low frequency energy. Preemphasis means the alteration of

the magnitude of select frequency components of an electrical signal for reducing noise (col. 2, lines 50-54). The present invention, however, does not classify the audio data by frequency components. The present invention performs the AGC preprocessing of frames such that the AGC preprocessed frames are encoded in a higher bit rate rather than reducing noise from the frames.

There is no basis for combining the teachings of DeJaco, Malvar, and Davis. In Malvar, the automatic gain control is merely used to handle the degraded speech in the codec. In Davis, the preemphasis is to alter the magnitude of select frequency components of an electrical signal for reducing noise. These are far different from determining the speech encoding rate in the vocoder. Accordingly, DeJaco, Malvar, and Davis are not combinable with each other. In other words, using the automatic gain control to handle the degraded speech in the codec, performing preemphasis on a signal prior to encoding or decoding and determining the speech encoding rate in the vocoder are so different from one another that one of ordinary skill in the art would have no reason to combine teachings from one of these areas and apply them to the other.

The rejection of Claim 5 under 35 U.S.C. §103(a) for obviousness over DeJaco in view of Malvar as applied to Claim 4 above and further in view of U.S. Patent No. 4,912,766 to Forse ("Forse") is respectfully traversed.

Forse is cited for teaching a system that uses automatic gain control in a speech application, where the system inputs a speech signal, determines spectral parameters, stores gain coefficients for each spectral parameter and then uses the lowest of the gain coefficients to adjust the magnitude of the spectral parameters. However, even if this is true, Forse does not overcome the above-noted deficiencies of DeJaco and Malvar.

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Thus, the rejection of Claim 5 (which is dependent from Claim 4) for obviousness over DeJaco in view of Malvar and Forse is improper and should be withdrawn.

For the above reasons, Applicants respectfully submit that the present invention should be granted since the cited references, whether taken individually or in combination, do not teach or suggest each and every feature of independent Claims 2, 4 and 6-9. Also, Applicants submit that Claims 3 and 5, which depend from Claims 2 and 4, respectively, are in a condition for allowance.

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CONCLUSION

Applicants respectfully request that a timely Notice of Allowance be issued in this case.

It is requested that a three-month extension of time be granted for the filing of this response, and the appropriate extension filing fee of \$525 needs to be charged to Deposit Account No. 19-0513.

If any other fees, including extension of time fees or additional claims fees, are due as a result of this response, please charge Deposit Account No. 19-0513. This authorization is intended to act as a constructive petition for an extension of time, should an extension of time be needed as a result of this response. The examiner is invited to telephone the undersigned if this would in any way advance the prosecution of this case.

Respectfully submitted,

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